



River Voices

From Slaughterhouses to Swimming Races:

Restoring Rivers Within City Limits

by Amy Souers Kober & Betsy Otto, American Rivers www.americanrivers.org

The Bronx River flows through some of the most impoverished communities in the nation. For years the river was largely forgotten, hidden behind industrial buildings and piles of scrap metal, lost under highways and elevated tracks. A local woman who grew up near the river was quoted in *The New York Times* admitting, "It did not occur to me that there could be anything natural in the Bronx."

A few years ago, a golden ball descended on New York City. In one day, this ball and its keepers floated down the Bronx River, from the outer suburbs to the inner city. People from diverse neighborhoods, dancers and musicians walked the ten-mile route, following the ball's journey down the river that connects their homes. Celebrations along the riverbank welcomed the golden ball, a symbol of life, sun, world and energy. This community art event spotlighted the renaissance of the Bronx River.

Now that the City of New York is investing in the waterfront, the river's natural qualities and beauty will be more apparent and accessible. The Manhattan Waterfront Greenway, a 32-mile route that circumnavigates the island, now boasts off-street bike and pedestrian paths, increased access to the waterfront and the transformation of the Harlem

River Speedway and other industrial waterfront property into promenades and parks.¹ As the river comes back to life, it is attracting tourists and becoming a place of respite for locals. It proves that nature does indeed exist in the city.

River Renaissance

Rivers haven't always been so valued. In the mid-nineteenth century, many cities turned away from their rivers as railroads made water transportation obsolete. Waterfront streets and shops were abandoned. Industries and scrap yards overtook the

banks. Many urban rivers were little more than open sewers, conduits for waste.

But today, thanks to the successes of the Clean Water Act, most of our urban rivers are no longer toxic or pose a direct threat to human health. And as many cities shift from an industrial to a service economy, factories, smokestacks and warehouses no longer monopolize every riverbank. Environmental consciousness is more

prevalent today, and growing interest in outdoor recreation has more people interested in what their local rivers have to offer. City planners are realizing that an attractive riverfront can act as a magnet that keeps people and businesses downtown and counteracts sprawl.



Photo credit: Bronx River Alliance

The Golden Ball is guided down the Bronx River, demonstrating a connection between neighborhoods and their river.



River Network

Connecting People, Saving Rivers

CONTENTS

- 1** Restoring Rivers Within City Limits
by Amy Souers Kober & Betsy Otto
- 3** From the President
- 9** Eleven Places to Look for Restoration Opportunities
Excerpt from Center for Watershed Protection
- 14** Challenges & Opportunities in Urban Watersheds
by Jane Calvin
- 17** What is Your River Worth?
by Mary Hanson
- 20** Planning for Riverfront Revitalization
by Helen Sarakinos
- 24** Voices from the Field
- 28** Educating the Stewards of Tomorrow
by Damian Griffin
- 31** Why We Need to Take Our Streams Out of Pipes
by Carole Schemmerling
- 34** It Takes a City
by Mary Olivia Harrison
- 37** EPA Getting in Step: A Guide to Outreach Campaigns
- 38** Resources & References
- 39** Partner Pitch

River Voices is a forum for information exchange among river and watershed groups across the country. River Network welcomes your comments and suggestions. River Network grants permission and encourages sharing and reprinting of information from *River Voices*, unless the material is marked as copyrighted. Please credit River Network when you reprint articles and send the editor a copy. Additional copies and back issues are available from our national office.

Editor: Waverly de Bruijn

Editorial Assistance: Jacob Cohen, Kevin Kasowski, Katherine Luscher

Design & Layout: Greer Graphics

NATIONAL OFFICE

520 SW Sixth Avenue, Suite 1130 • Portland, OR 97204-1511

503/241-3506 • fax: 503/241-9256

info@rivernetwork.org • www.rivernetwork.org

River Network is a national, nonprofit organization whose mission is to help people understand, protect and restore rivers and their watersheds.

RIVER NETWORK BOARD OF TRUSTEES

Todd Ambs
Catherine Armington
Suzi Wilkins Berl
Rob R. Buirgy
Kimberly N. Charles
Mary Ann Dickinson
Barbara J. Horn
Dave Katz

Leslie Lowe
Ezra Milchman
Paul Paryski
Marc Taylor, *Chair*
Ms. Balijit Wadhwa
James R. Wheaton
Robert L. Zimmerman, Jr.

RIVER NETWORK STAFF

Matthew Burke
Ryan Carter
Jacob Cohen
Waverly de Bruijn
Steve Dickens
Dawn DiFuria
Merritt Frey
Bevan Griffiths-Sattenspiel
Jean A. Hamilla
Kevin Kasowski

Gayle Killam
Katherine Luscher
Deb Merchant
Ezra Milchman
Mary Ellen Olcese
J.R. Ralston
Michelle Seely
Diana Toledo
Stephen Twelker
Wendy Wilson

From The President

The most celebrated successes of the environmental movement are largely focused on the pristine. Dams have come down to return our rivers to their natural flows. Wild and Scenic designations have been achieved for many of our unspoiled rivers. And ecotourism businesses like rafting and fishing have flourished on remote waterways across our country.

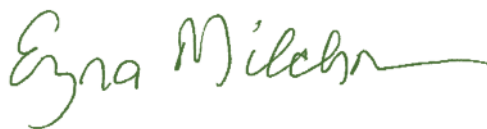
We cherish our natural heritage when it's intact, but we often ignore it when it's degraded. For our movement to achieve its mission, it is critical that we focus our attention not only on pristine rivers, but also on the often overlooked rivers that flow through our cities. 81% of our country's population lives in cities and suburbs, representing a major confluence of resources, political power and potential volunteers. We must view urban centers as a key part of the solution, a place where businesses, community groups, government and industry join together to enhance and restore urban rivers.

Already, we are seeing impressive progress. Over the past several decades, we have witnessed rebirth from the Willamette River in Oregon to the Bronx River in New York. Rivers once seen as conduits for sewage, pollutants and trash—rivers that have been paved, covered and channelized—are now major components of urban revitalization plans.

But our work is far from done. To ensure a healthy future for all life, both in the water and on the land, we must enhance public commitment to restoring urban waterways. If we can succeed in our cities, we can succeed anywhere as we work to create a more environmentally sustainable society.

Many River Network Partners are pursuing this work as we speak and their stories point the way forward. You can read about a number of victories and projects in motion in this issue of *River Voices*. Together, let's make America's urban river restoration emblematic of our power as a river protection movement.

In partnership,



Ezra Milchman
President & CEO

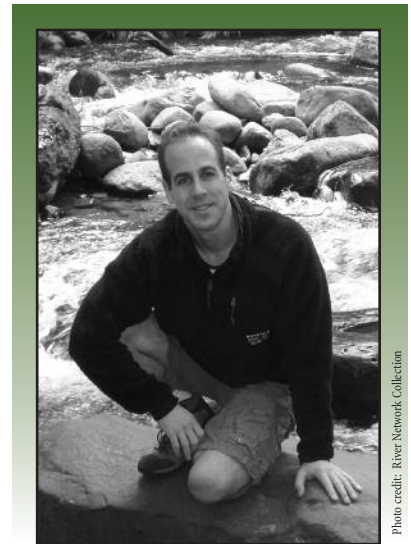


Photo credit: River Network Collection

Restoring Rivers Within City Limits, cont.

cont. from page 1

River renaissances similar to that of the Bronx are taking place across the country in cities like Chicago, Denver, Redmond (WA) and San Antonio. The attraction of urban rivers isn't new—what's new is that cities are now aiming for more than economic development. Many of today's cities are taking a more comprehensive approach, incorporating multiple objectives: ecological integrity, economic vitality and a sense of community. These visionary cities are proving that an ecologically healthy river can be the centerpiece of successful and sustainable city revitalization.

But what constitutes good riverfront development? What kind of planning is best for the river? While there is no single blueprint that fits every river, there are some general principles planners should stick to. And recent riverfront projects offer lessons about desirable and not-so-desirable approaches.

RiverWalk, RiverShop, RiverEat

Over the past 30 years, most riverfront revitalization efforts have been driven by economic goals alone. San Antonio, Texas is a prime example of a city that used its riverfront to pump new life into its downtown economy. The San Antonio River Walk, along with the Alamo, are the most visited attractions in the state.

A good riverfront makes the most of the river's character. It incorporates the community's history and culture. A good riverfront captures the spirit of place and

creates a distinctive, memorable experience. This is where the San Antonio River Walk succeeds. The city's development and promotion of the River Walk's unique character has been so successful, many other cities look to San Antonio as a model. Signage and other pedestrian-scale design guidelines maintain the style of the pathways and buildings. Visitors can walk alongside the river to shops, restaurants, hotels and entertainment facilities. They can glide in natural gas-powered boats past storefronts, shaded rock walls and bridges. But until recent efforts to restore the sterile concrete-lined river channel and add back other natural stream features, San Antonio's riverfront had been mostly ecologically dead for decades.



A calm morning on the San Antonio River Walk.

Now that the San Antonio River has become a major attraction for both the community and out-of-towners, the San Antonio River Improvements Project is focusing on the restoration needs of the Museum Reach (northern) and Mission Reach (southern) sections of the river. Improvements along the Mission Reach will focus on ecosystem restoration using fluvial geomorphology. This technique will

transform the straightened river to replicate the original flow of the river while maintaining flood control, reducing erosion, re-introducing native vegetation and creating an environment more suitable for recreation and wildlife.² Phase one of the Mission Reach project is slated for completion in December 2009.

Community Benefits

For years, the Chicago River was a sewer clogged with slaughterhouse waste, a working canal monopolized by barges. In 1885, a cholera and typhoid epidemic killed 90,000 Chicagoans when a storm washed sewage from the Chicago River into Lake Michigan, the city's drinking water source. Then, in 1889, sanitary engineers dug a canal to reverse the flow of the river south into the Illinois River to prevent a recurrence of epidemics, giving the city the world's only river that flows backward.

Today, however, the Chicago River and other area waterways are on the rebound, thanks to water quality improvements and a large-scale restoration effort. The local conservation group, Friends of the Chicago River, even holds annual swimming races.

The City of Chicago has implemented big plans for its riverfront, with economic vitality as one of the goals. But the city is also insisting on high water quality, increased public access, enhanced wildlife habitats and better recreation opportunities.

Now, in addition to industrial barges, the river also hosts families in pedalcrafts, couples sipping champagne in gondolas, pedestrians strolling on riverside walkways, herons perching on the banks, and even though the fish aren't safe to eat just yet, fishermen hauling out bluegill and bass.



Photo credit: Detroit Publishing Co. #018839. Library of Congress via Eastland Memorial Society

Today, nearly 70 species of fish inhabit the river, where once only carp survived.

The Chicago River,
circa 1905.

Restoring urban waterways has its challenges—with public access to the river being an initial hurdle. Easy, safe and affordable public access via foot, bike, public transit or boat is critical to any good riverfront plan. And the river should be visually accessible (frequent, interesting views from parks, picnic areas, shops and restaurants), as well as physically accessible.

In the Chicago public housing development of Lathrop Homes, access was one of the riverfront restoration goals. Residents created a riverside path, re-graded the steep bank, built graceful steps down to the river edge and added benches so they could sit under riverside trees.

Local children planted hundreds of new grasses and shrubs and created a meandering wood-chipped path—a plus for the residents and a plus for the river. Smart riverfront designs use a minimum of concrete sidewalks and other forms of “hardscaping” which creates stormwater runoff that degrades river

cont. on page 6

Restoring Rivers Within City Limits, cont.

cont. from page 5 water quality and causes bank and in-stream erosion. Porous materials, like mulch, gravel and sand allow rainwater and snowmelt to absorb into the ground rather than rushing directly into the river.

In addition to connecting people with the river, a good riverfront design connects the neighborhood with the larger community. A network of pathways should link surrounding homes, shops, offices and recreation areas. The Lathrop Homes revitalization project includes a pedestrian pathway to nearby shopping centers.

The Chicago River is also getting a boost from several wetland restoration projects.

BRIGHT IDEA

Hold swimming events (if your river is swimmable) to raise awareness and appreciation for your river. In addition to Friends of the Chicago River, the Charles River Swimming Club is an organization that organizes competitive swimming events to facilitate the return of river swimming and encourage continued clean-up of the river.

www.charlesriverswimmingclub.org



Wetlands are essential parts of a river ecosystem and should be protected or enhanced in any riverfront plan. While wetlands can't filter out certain urban pollutants like salt, lead and mercury, they are very effective in improving overall water quality.

In a suburb north of Lathrop

Homes, volunteers helped restore wetlands in Prairie Wolf Slough to manage stormwater. This site in the Chicago River floodplain now contains 28 acres of restored wetland and wet prairie as well as 14 acres of restored forest. Prairie Wolf Slough now

retains excess water and helps reduce flooding. It also filters out pollutants from nearby commercial and residential developments.

Restoring Nature's Buffers

Old mattresses, rubber tires, grass clippings and diesel oil. Concrete trucks backing up and flushing out their mixers, releasing a gray lava-like flow onto the riverbank. Not so long ago, these were the common sights on Denver's South Platte River.

Today, visitors are more likely to see mallards, catfish and kids along the river. Denver's \$25 million South Platte River Project rehabilitated the South Platte, creating new parks and greenways, restoring wildlife habitat and providing natural flood control. Using state-of-the-art water resources engineering, over 300 acres of land in north Denver and south Adams County were removed from the 100-year floodplain.³

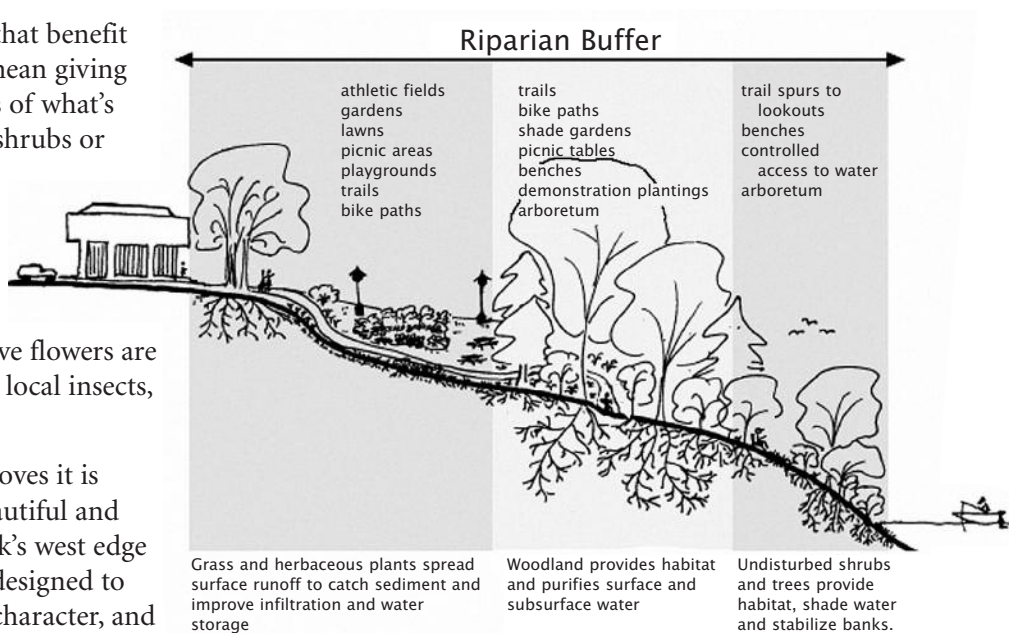
A centerpiece of the riverfront revitalization effort is the 23-acre Commons Park. Opened in 2001, the Commons was constructed on land that previously supported railroad tracks and warehouses.⁴ Riverside parks and their associated grass, open space and trees are always better for a river ecosystem than, say, a riverside parking lot. But some parks are definitely better for the river ecosystem than others.

A good park essentially serves as a bulwark between developed areas and the river. Depending on the size of the stream and the space available, the buffer can stabilize eroding banks (35+ feet), remove pollutants (100+ feet), protect wildlife habitat (300+ feet) and protect against flood damage (needs to cover large portion of floodplain).

Creating parks and buffers that benefit the river ecosystem might mean giving up some traditional notions of what's "pretty." Pruned geometric shrubs or overly landscaped and manicured turf lawns, for example, don't encourage biodiversity and often require harmful pesticides. Beds of non-native flowers are not the best food source for local insects, birds and wildlife.

Denver's Commons Park proves it is possible for a park to be beautiful and ecosystem-friendly. The park's west edge along the South Platte was designed to enhance the river's natural character, and a special "seep," or wetland with water-loving plants like sedges and cottonwoods, will handle the river's occasional floods.

Since the restoration began, local school kids have been reconnecting with the river. Inner-city kids now have the opportunity to be trained as river tour guides and tens of thousands of school children have taken field trips to the river to learn about the ecosystem and South Platte history. Interpretive kiosks and signs can help both children and adults understand the river's place in community history and current life.



Good riverfront plans foster education...and fun. At one of Denver's first riverside parks, the highlight isn't native plants, it's whitewater. At Confluence Park, kayakers can slip out during their lunch breaks to paddle class II-III rapids.

The most effective urban buffers have three zones: streamside, middle zone and outer zone.

Restoring a River's Natural Flow

Redmond, Washington's Sammamish River is typical of many urban and suburban streams. The river lost much of its riparian area and native vegetation when the Army Corps of Engineers straightened and reconstructed the river into a deep trapezoidal channel in the 1960s. Straitjacketing the river destroyed habitat and dealt a blow to the river's once-abundant salmon.

The Army Corps' heavy-handed approach defied the most basic rule in riverfront planning: 'let the river be a river.' Fortunately, that fundamental principle is now the driving force behind Redmond's revitalization project. Today, the river is regaining its shape, flow and other natural

BRIGHT IDEA



Shade your riverside promenade with native grasses and other plants that promote the original, natural state of the river.

cont. on page 8

Restoring Rivers Within City Limits, cont.

cont. from page 7

characteristics. Out behind City Hall, engineers are re-creating some of the river's meanders and curves and adding boulders, root wads and gravel bars to the once uniform and sterile channel.

Salmon have already benefited from a pilot project on another 300-foot long stretch of riverbank. Just west of City Hall, the bank was graded

into a series of earth benches. The top of the bank was moved back from the river about 50 feet at its maximum point. These benches were planted with native vegetation

and provide the potential for different habitat zones. They also are helping to maintain the river's flood flow capacity.

Tying these restoration projects together is Redmond's new riverwalk, a thoroughfare of joggers, bikers, shoppers and migrating salmon.

Looking to the Future

From the golden ball of the Bronx to the red fish of Redmond, riverfront revitalization projects are changing the way we see ourselves in our environments. People are reconnecting with their rivers. As former Mayor of Milwaukee, John Norquist, wrote from the banks of the Milwaukee River, "When people walk, talk, work, eat, drink,

boat and play by the water, when it becomes part of their day-to-day life and not merely a special-occasion destination, a real constituency for clean water is created."

Many revitalization successes show us what can be done when urban river revitalization is recognized as an opportunity to boost local economies and quality of life. River

groups can play a particularly valuable role in making the case for restoring river health along with economic vitality. River advocates can start today by compiling facts and arguments showing how the community will benefit from river revitalization, involving the community to

determine their needs and vision for a revitalized riverfront, conducting assessments of the river and watershed for areas where potential restoration efforts can be made, and creating a revitalization plan to put all of this into action. The following articles of this *River Voices* will help you begin to delve into these issues.

For more on this subject see the report co-authored by American Rivers and the American Planning Association called *Ecological Riverfront Design*, available on American Rivers' website.

An earlier version of this article originally appeared as *Restoring Rivers Within City Limits* by Amy Souers and Betsy Otto in *Open Spaces* volume 3 number 4, www.open-spaces.com/article-v3n4-rivers.php. It has been updated and condensed.



1 New York City Department of City Planning, Manhattan Riverfront Greenway.

www.nyc.gov/html/dcp/html/mnwg/mnwghome.shtml

2 San Antonio River Improvements Project Fact Sheet. www.sanantonioriver.org/facts.html

3 Denver Public Works Press Release, *Largest Flood Control Project in the Metropolitan Area Complete*. www.denvergov.org/Portals/485/documents/South%20Platte%20River%20Project%20release.pdf

4 City Parks Forum Briefing Paper 01, *How cities use parks for...Community Revitalization*. American Planning Association. atfiles.org/files/pdf/citiesparksrevitalization.pdf

Eleven Places to Look for Restoration Opportunities

The most important skill in urban watershed restoration is an ability to envision restoration opportunities within the stream corridor and upland areas. It takes a practiced eye to find these possibilities in a landscape dominated by the built environment. Still, many good restoration opportunities can be discovered.

Each watershed is composed of a number of smaller watersheds called “subwatersheds,” which generally have a drainage area of five to 10 square miles or less. The small size of subwatersheds makes them ideal restoration candidates for several reasons:

- Subwatersheds can be rapidly mapped and assessed for restoration potential in a matter of months, with an initial restoration strategy following soon after.
- The small scale of a subwatershed also allows restoration practices to be designed, constructed and assessed within a few years.
- Most subwatersheds are contained within a single political jurisdiction, making it easier to coordinate local stakeholders.

Urban subwatersheds, or smaller units within the larger watershed, are a complex mosaic of both impervious and pervious cover. The best restoration opportunities are usually found in the remaining pervious areas. As much as three to five percent of subwatershed area may be needed to locate enough restoration practices to repair or improve stream conditions. Further, this land must be located in the right place and be controlled by willing landowners. Lastly, restoration sites are distributed across dozens and sometimes hundreds of small parcels within a subwatershed.

The process of discovering these opportunities is called “envisioning restoration,” and consists of two basic techniques: intensively analyzing maps and aerial photographs, and conducting a rapid reconnaissance of actual conditions in the subwatershed. Both techniques are as much a skill as a science, and certainly no computer model can do the same jobs.

The Remnant Stream Corridor

The stream corridor is the first place to envision restoration. Regrettably, the urban stream network is poorly portrayed on most maps. Stream interruptions, crossings and channel alterations are not depicted, and the width and condition of the stream corridor are seldom delineated with any accuracy (indeed, it is usually shown on maps as undefined white space between buildings, streets and parking lots). Aerial photographs that show current vegetative condition are the best tool for defining the approximate boundaries of the stream corridor.

While maps and photos are a starting point, the stream corridor can only be truly seen by walking the entire stream network.¹ The stream corridor is an important place to envision restoration because it is the transition zone between the upland storm

This article was adapted with permission from Urban Subwatershed Restoration Manual 1: An Integrated Approach to Restore Small Urban Watersheds; Chapter 5: Envisioning Restoration

Prepared by
Tom Schueler

Center for Watershed
Protection

www.cwp.org

cont. on page 10

Eleven Places to Look for Restoration Opportunities, cont.

cont. from page 9

Eleven Places to Envision Restoration in a Subwatershed

1. Remnant Stream Corridor
2. Existing Stormwater Infrastructure
3. Open Municipal Land
4. Natural Area Remnants
5. Road Crossings and Rights-of-way
6. Large Parking Lots
7. Stormwater Hotspots
8. Residential Neighborhoods
9. Large Parcels of Institutional Land
10. Sewer Network
11. Streets and Storm Drains



drain network and the urban stream. Within this narrow zone, there is often enough available land to install restoration practices to repair or improve stream conditions. These include storage retrofits, riparian management and discharge prevention practices.

Existing Stormwater Infrastructure

Each subwatershed has a vast network of catch basins, storm drains, outfall pipes, detention ponds, flood ways and stormwater practices that convey stormwater. The existing stormwater system is attractive for restoration for two reasons. First, as much as three percent of total subwatershed area may be devoted to the stormwater system (although often at the expense of the existing stream corridor). Second, since land is already devoted to stormwater management, it is much easier to get approval from owners to retrofit it.

Large parking lots produce the highest unit area of stormwater runoff and pollutant loadings of any subwatershed land use, and stand out in most aerial photographs.

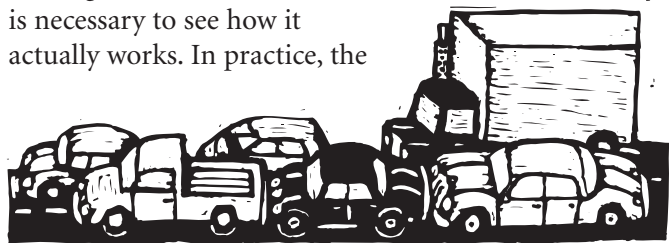
The restoration potential of a stormwater infrastructure depends largely on its age. Stormwater systems constructed prior to 1970 are mostly underground, with limited surface land devoted to flood control projects. Systems from 1970 to 1990 were often built with stormwater detention ponds designed to control peak flood discharges. Detention ponds, which are often quite large, greatly add to the surface land available for potential restoration, and are always a favorite target for storage retrofits. Systems designed over the last decade reflect the growing trend toward the treatment of stormwater quality, and may contain dozens of stormwater treatment practices of all different sizes and types.



Photo credit: Center for Watershed Protection

These newer practices are a particularly attractive retrofitting target. A good map of the urban stormwater pipe system is extremely helpful, if available. Several locations on these maps deserve close scrutiny: outfalls where stormwater pipes discharge, open land adjacent to these outfalls, and any surface land devoted to stormwater detention and/or treatment. These locations are prime candidates for storage retrofits and stream daylighting practices. Stormwater outfalls are also the starting point to look for illicit discharges that may be flowing through the storm drain system.

In reality, the stormwater pipe network is poorly mapped in most communities, and often reflects a confusing blend of pipes and structures built in many different eras. So once again, field reconnaissance is necessary to see how it actually works. In practice, the



many routes that stormwater travels to get to the stream corridor must be traced by working up from each storm drain outfall.

Open Municipal Land

Municipal lands such as parks, public golf courses, schools, rights-of-way or protected open space are attractive areas for restoration because of their large size and ownership. While municipal lands are managed for different purposes, portions of each parcel may be good candidates to creatively locate restoration practices. In addition, open lands are easy to distinguish on either aerial photographs or tax maps, and are easy to confirm in the field.

Natural Area Remnants

Forest and wetland fragments are frequently located near the stream corridor, and the larger contiguous parcels are hard to miss when looking at an aerial photograph or resource inventory map. Larger remnants and their adjacent margins always deserve close scrutiny in the field. A two-acre size threshold is often used to select parcels for field analysis. Natural area remnants are not a preferred location for intrusive restoration practices (such as a large storage retrofit), but may be good targets for forest or wetland restoration. In addition, the possibility of expanding natural areas or linking them to the stream corridor or other remnants should always be considered.

Road Crossings and Highway Rights-of-Way

Road crossings and rights-of-way are always worth exploring for restoration opportunities. Stream crossings are quite easy to spot on aerial photos or

regular maps. Two specific areas of the map should be located: the points where roads cross the stream corridor, and large rights-of-way, such as cloverleaf interchanges and highway access ramps.

Each road crossing presents both a problem and an opportunity. Bridges and culverts that cross the corridor are always suspected barriers to fish migration, but they may also unintentionally act as a useful grade control in a rapidly incising stream. In very small streams, these crossings can be modified to provide temporary storage and treatment of stormwater upstream of the crossing. Lastly, road crossings often provide the best access to the stream corridor for stream assessments, cleanups and construction equipment.

cont. on page 12

Eleven Places to Look for Restoration Opportunities, cont.

cont. from page 11

Larger highways often have fairly large parcels of unused land near interchanges in the form of cloverleaves and approach ramps. These parcels can be an ideal location both for storage retrofits and reforestation, because they receive polluted runoff from the highway and generally serve no other purpose.

Large Parking Lots

Large parking lots really stand out in an aerial photograph or land use map and are of great interest for several reasons. First, they produce more stormwater runoff and pollution on a unit area basis than any other land use in a subwatershed. As such, they are obvious targets for on-site or storage retrofits. Second, large parking lots generally signal the presence of large clusters of commercial, industrial or institutional lands often associated with stormwater hotspots. While these areas can be easily identified from a desktop, it is usually necessary to visit each one to determine its actual potential for retrofitting or source control.

Stormwater Hotspots

The next place to envision restoration is in the many stormwater hotspots in a subwatershed.



Stormwater hotspots are the commercial, industrial, institutional, municipal, and transport-related land uses that tend to produce higher levels of stormwater pollution, or present a higher risk for spills, leaks and illicit discharges. The number, type and distribution of stormwater hotspots vary enormously between subwatersheds. Maps and aerial photos are of little value in finding hotspots; instead, they can be found by searching databases that contain standard business codes or permits, or by driving the entire subwatershed looking for them, or both.

Residential Neighborhoods

Residential neighborhoods are easy to see on a map, but must be visited to be truly understood. Each residential neighborhood has a distinctive character in terms of age, lot size, tree cover, lawn size and general upkeep. In addition, neighborhoods tend to be rather homogenous when it comes to resident behavior, awareness and participation in restoration efforts. Each unique neighborhood characteristic directly affects the ability to widely implement residential restoration practices, such as on-site retrofits and residential stewardship practices. In general, it is not easy to discern neighborhood characteristics from a map or even an aerial photograph. Instead, a neighborhood assessment² can be used to

BRIGHT IDEA

Stencil stormwater drains to educate the community about the impacts of dumping hazardous materials down the drain—and into the river.

www.epa.gov/adopt/patch/html/guidelines.html



collect quantitative data on neighborhood characteristics to determine their restoration potential.

Large Institutional Land Owners

Large institutional land owners have the last remaining land worth prospecting for restoration potential in a subwatershed. Examples include hospitals, colleges, corporate parks, private golf courses, cemeteries and private schools. Inspection of aerial photos may reveal that institutions have underutilized areas on their grounds with restoration potential.

The Sewer System

The sewer system is always an important place to envision restoration potential, although it is intrinsically difficult to see since most of it is located underground. Most communities have good maps of their sewer pipe networks, although older portions may be much less reliable. The key factor to determine is whether the sewer system is a source of sewage discharges to the stream corridor that it often parallels. The severity of sewage discharge depends on the age, condition, and capacity of the sewer network.

Streets and Storm Drain Inlets

Pollutants tend to accumulate on street surfaces and curbs, and may be temporarily trapped within storm drain catch basins and sumps. These storage areas often represent the last chance to remove pollutants and trash before they wash into the stream. Municipal maintenance practices, such as street sweeping, catch basin clean-outs and storm drain stenciling, can potentially remove some fraction of these pollutants, under the right conditions. These municipal practices are particularly well-suited for highly urban subwatersheds that have many streets, but few other feasible restoration options.

Summary

This article described how and where to search for restoration potential in urban subwatersheds. Each subwatershed has a different combination of opportunities and thus different restoration potential. The next step for any river or watershed organization would be to create a framework for translating these possibilities into a realistic subwatershed plan.



¹ The Unified Stream Assessment (USA), described in Center for Watershed Protection's *Urban Subwatershed Restoration Manual 10*, has been developed as a tool to systematically evaluate the remaining stream area.

² For more information, see the Neighborhood Source Assessment (NSA) component of the Unified Subwatershed and Site Reconnaissance (USSR), found in Manual 11 of the Center for Watershed Protection's *Urban Subwatershed Restoration Manual Series*.

Protecting Open Spaces:

Challenges & Opportunities in Urban Watersheds

by Jane Calvin
Lowell Parks &
Conservation Trust
www.lowelllandtrust.org



Many river groups working in urbanized areas have looked for ways to improve the health, vitality and access to the rivers and streams that run through the place they call home. In order to restore a watershed and its rivers, groups must look to the preservation and restoration of land in areas all over the city and throughout the watershed. At the watershed scale, river restoration projects often focus on mitigating stormwater by retrofitting impervious surfaces. At a more localized scale, protecting and connecting parcels of land along the river corridor can be vital to establishing buffers that provide habitat, stormwater runoff filters and importantly, access to the river itself. By creating access to an urbanized river corridor you engage neighborhood residents that can then become stewards of the river and the land it runs through. When community members can develop and strengthen an appreciation of the environment in their own backyard, they can then work to continue preserving and restoring some of their city's biggest hidden assets.

Protecting land in an urban setting requires addressing challenging and complex land protection issues and engaging diverse stakeholders, all while protecting the remaining conservation values of often marginalized properties. Creating access to a river in an urbanized community adds additional layers of complexity. Protecting urban open spaces requires the flexibility to look into parcels of a much smaller scale (ranging from thousands of square feet to a few acres); comprehension of land ownership and conservation finance mechanisms to access properties with often very high real estate value; and a strong local capacity to know your "place" intimately, including where and how to build effective partnerships. These "challenges" will then become assets and opportunities—to lace

together networks of unconnected riparian corridor, engage new stakeholders, address any potential brownfield sites and attract funders. Succeeding in urban land protection can mean creating access to open space for populations living in a neighborhood divided by industrial use or with limited recreational opportunities.

Making Creative Use of Land in Lowell, MA

Lowell, Massachusetts sits at the confluence of two rivers; the Merrimack, which flows north into New Hampshire, and the Concord, which flows south and is part of the Sudbury-Assabet-Concord (SuAsCo) watershed. Passing through one of the nation's first planned industrial cities (pop. of 104,000), the Concord River has been heavily industrialized, yet flows through vibrant, dense and ethnically diverse neighborhoods. Remarkably, significant open space still exists along the eastern banks of the river, held in large part by three property owners. The Concord River, Lowell's "hidden jewel," has been largely invisible to the public due to its historic and current industrial use, but also because roadways only cross the river at four bridges. Protecting the Concord River required "thinking outside the box" about alternative land protection mechanisms. The Lowell Parks & Conservation Trust (LP&CT) has been working for over a decade on one embodiment of such thinking on a project to create the Concord River Greenway Park.

The Concord River Greenway became the vision of an LP&CT board member after stumbling on the river in his own neighborhood as a young man. The Greenway, now in partial construction, is a 1.75-mile multi-use recreational trail which fills an important gap in our regional trail network. The northern end of the

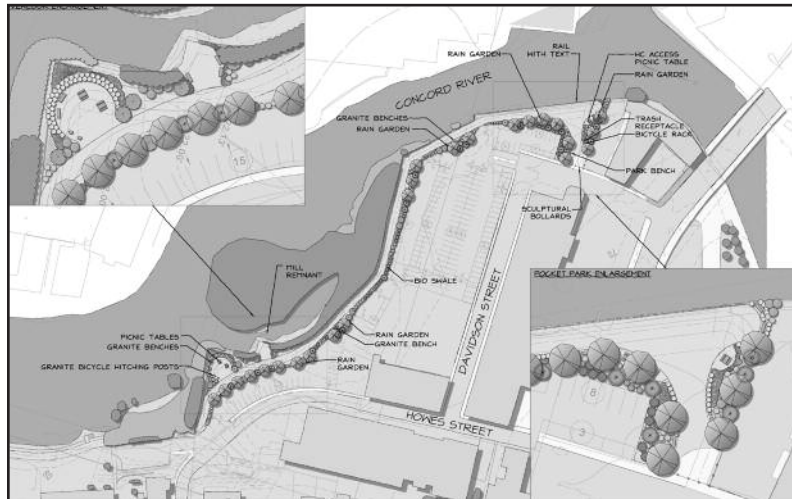
Greenway will connect with Lowell's downtown river trails and canal walkways. From the southern end the Greenway will eventually connect with a 25-mile trail that will follow an abandoned rail corridor from Chelmsford to Framingham.

Creative Land Protection Strategies

The Concord River

Greenway project exemplified how protecting land to create a park along an urban river corridor can be complex – and require years of patience. If your group is embarking on such a project, your approach may include some or all of the following creative land protection strategies:

- **Contaminated land:** Brownfields and parcels of contaminated land can be encountered along urban rivers. These remnants of the industrial age can be easier to acquire because the land is deemed less desirable and may even provide for itself through the ability to apply for specialized funding. Drawbacks of acquiring contaminated land include a longer, more arduous clean-up process. The northernmost terminus of the Greenway includes the addition of park land along the edge of a 3-acre parking lot which happened to be the site of a large brownfield. Brownfield funding that the City of Lowell received helped leverage additional funding for construction of the Greenway.
- **Tax delinquent properties:** Landowners that fall into excessive arrears in paying property taxes can have their land seized by the government, which then becomes a “tax title” property. Given the right



Design plans for a small portion of the Concord River Greenway.

circumstances, tax delinquent properties provide a relatively easy avenue for acquiring and protecting land. An inventory of tax delinquent properties on the Concord River Greenway corridor identified several narrow, undevelopable parcels of land previously used for water access rights that simply needed to be converted to conservation land.

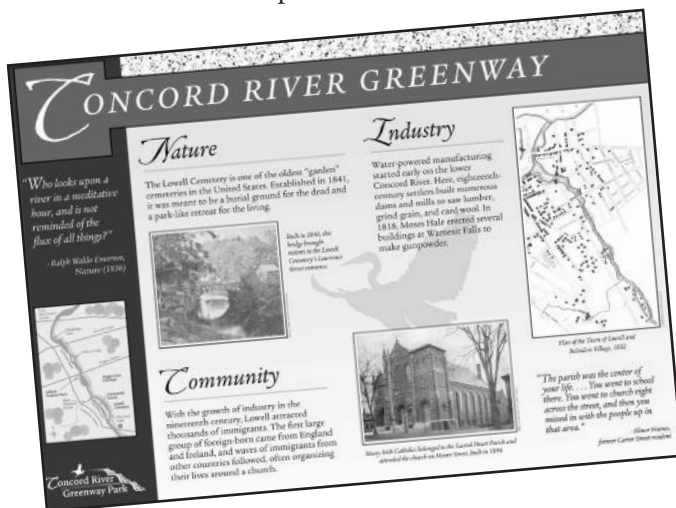
- **Land use conversion:** Identifying the mechanism to convert land to municipal ownership (the City of Lowell will own and maintain the Greenway once complete) doesn't necessarily permanently protect access to the land. In Massachusetts, these lands can be converted to “conservation land” under Article 97 of the MA General Laws, which protects them until the state legislature converts their use with a two-thirds vote.
- **Eminent domain:** Eminent domain can be used to help clear the title to land so that the property can be used for a public purpose. A portion of the Greenway will follow a former railway spur which was seized by eminent domain when land rights of the abandoned railroad property reverted to the previous, tax-delinquent owner.

cont. on page 16

Challenges & Opportunities in Urban Watersheds, cont.

cont. from page 15

- **Easement swaps:** The various layers of ownership in an urban area, while sometimes confusing, can also provide leverage in creating public access to the river. When the City of Lowell acted to take former railroad land by eminent domain, it erased a utility line easement held on the same property. This utility line leads to a substation on land held by one of three primary abutters to the Greenway. Working with the city, we're in preliminary negotiations to gain access through the utility's land in exchange for access to their power line corridor.



Along the Greenway, students and passersby can read about the history of the river corridor.

Creatively Combining Objectives

It is important to keep an eye out for creative funding opportunities in addition to creative land protection. You never know when such objectives will combine. For example, a city planner with a vision for the Greenway suggested that the city allow development of conservation land in the area (no longer needed for well head protection). This enabled the city to raise \$875,000 for the first phase of Greenway construction and manage to permanently protect an additional 10 acres behind the well head land at the same time.

Adding a creative element to the Greenway's design can also attract funders, stewards, and further land protection efforts. After attending several conferences, such as the National River Rally, I learned that the creative elements of trail design must be incorporated early on in the design phase. Now, through an intensive community-based process, the Greenway's design integrates public art into the infrastructure (fences, gateways, bridges and surfaces) of the trail. Furthermore, the river corridor's land use history is incorporated into six historic wayside panels that are the basis for a major outdoor classroom initiative with new partners.

From Land Protection to Community Engagement, and Back Again

We hope that the example of the Concord River Greenway initiative inspires you to get started on a long-envisioned project (that might seem as daunting as ours once did). Once the land is protected and the community can envision its future use, you never know who you'll meet on the trail. We aspire to create a multi-dimensional experience that can become a destination—for teachers interested in using it for environmental education, for those that are interested in learning about the land use history and ecology of the corridor, or for those that will enjoy the public art and renewed aesthetic of the river. By engaging neighborhood residents, students and artists in the Greenway corridor, we hope the cycle continues and that these same stakeholders who now have access to nature within their city will be more passionate and engaged in the further restoration and protection of their rivers and natural spaces.



What is Your River Worth?



What is your river worth? Most cities started as settlements along a river, where barge traffic and ferries brought people and supplies in and out of the region. Eventually conditions changed as railroads and then highways took over as the main form of transportation. Traditional businesses using the riverfront went away as industry moved in. As some cities began replacing industry and manufacturing with service sector jobs, canneries closed, manufacturing plants moved and housing was moved farther away from the river. Over the years, the riverfront became an abandoned industrial site; a dark, ugly place to be avoided.

Still, there are residents who can look past the ruins and see the potential of their river. These river supporters or watershed groups see the environmental and economic benefits of restoring an urban river. The problem is that while your organization understands the intrinsic value of your urban river and its possibilities, other stakeholders may not.

One important aspect of building a case for river revitalization is to impress upon others the tangible values—such as economic benefits—of such an endeavor. Each community and their river have their own unique circumstances. Build a rationale for

your river, drawing on examples that fit your situation. The following is a list suggesting topics and how to gather the data to build an economic rationale in favor of greenways and other river projects.

Quote Examples from Successful Projects

People like to hear positive examples of riverfront redevelopment to be assured that other communities have already had successes. Quoting from other examples allows you to present evidence that greenways and trails may increase nearby property values and demonstrate how an increase in property values can increase local tax revenues and help offset greenway acquisition costs. There are many examples of the economic benefits available through academic research, web sites and city offices. Even with swings in the real estate market, people will still pay more for housing near a green space, especially if water is nearby.

- **Increased Property Values.** Astoria, Oregon lies on the south bank of the lower Columbia River estuary.¹ The community suffered from the loss of the cannery industry, and a rail line blocked access to the river. As part of a master plan to restore the riverfront, a

by Mary Hanson
Rivers, Trails &
Conservation Assistance
National Park Service
www.nps.gov/rtca

HOW TO FUND YOUR URBAN REVITALIZATION NEEDS

These are tough times for nonprofit environmental groups. The topsy-turvy economy has created a roller coaster for our funders and major donors, making it more difficult for them to sustain our crucial work. But if you've got gumption and a good idea, look into River Network's extensive list of over 100 river and watershed funders in the *National Directory of Funding Sources*, now available on River Network's Partner-only website.

www.rivernetwork.org/rn/partners



cont. on page 18

What is Your River Worth?, cont.

cont. from page 17

mixed-use neighborhood brownfield redevelopment now offers houses from \$150,000 to \$500,000 where a contaminated, unused piece of land once stood, and received the Phoenix Award for this project's results.

- **Reduced Agency Expenditures.** Explain how the agency responsible for managing a river, trail or greenway can support local businesses by purchasing supplies and services. Jobs created by the managing agency may also help increase local employment opportunities and benefit the local economy. Leaders in Johnson County, Kansas, expected to spend \$120 million on stormwater control projects. Instead, voters passed a \$600,000 levy to develop a countywide streamway park system. Development of a greenway network along streambeds addressed some of the County's flooding problems, and provided a valuable recreational resource.²
- **Increased Tourism Revenue.** Describe how greenways, rivers and trails, which attract visitors to a community, support local businesses such as lodging, food establishments and recreation-oriented services. Greenways may also help improve the overall appeal of a community to visitors and increase tourism. The San Antonio River Walk is has come to be a major anchor of the visitor industry in San Antonio, Texas, and has helped create the city's annual Tourism revenue of over \$8.7 billion.³ The River Walk provides a downtown staging ground for public festivals and celebrations such as Fiesta Noche del Rio, Fiesta de Las Luminaries and Las Posadas and it offers a safe and attractive pedestrian system for the downtown area.

Find Evidence of the Effects of Greenways on Property Values in Your Community

Research of demographics and changes to the housing and business markets are tracked by universities, Smart Growth organizations, realtor associations and others.⁴ Due to the significant impact housing prices can have on a community, many studies are available to show the effects of greenways on property values. The University of Nebraska-Omaha completed surveys along three trails, two of which were alongside creeks in Omaha, Nebraska. Almost two-thirds of those surveyed felt the trails would increase the selling price of their home.⁵

Conduct Interviews on How Open Space Amenities Affect Land Values

The National Association of Realtors (www.realtor.org/research) provides information from across the nation on real estate trends, but visiting with local real estate agents and appraisers can give you the latest, up-to-date information for your community. Potential buyers tell them their desires for housing and amenities. Agents want to fulfill these requests to make sales.

Reviewing assessments and sales at the county assessor's office can also demonstrate housing trends. Find a nearby community that has already implemented a riverfront redevelopment. Compare sales of a typical housing-only suburb to a mixed-use development along the river. Determine the percentage difference. Use that number to show how redevelopment along the river could increase property values and tax revenues.

Survey Local Residents

Let local residents tell you what they think. Most will be very pleased to have been asked their opinion. Once again, quality of life with economic viability will be their primary interests. It is also an opportunity to provide information on the local river or watershed group's ideas. Have brief information on the economic benefits and photographic or hand rendered examples researched and available to support your cause.

A survey does not need to be formal or complicated. Find examples from previous studies; visit with a college or university professor in a related field; ask the city offices what information they and the community see as pertinent. There may be students who need to complete research or would be interested in assisting in the surveying.

Ask the most important questions, but keep it short. A few key questions can provide the information you need without overwhelming everyone involved. Compare the results with past surveys for new information and correlation. Format the information into easily understood handouts and presentations so it is easy to present when opportunities arise.

Document How the Greenway has Changed the Design of the Neighborhood

When an area is improved, are people now building more expensive homes? Is there an increase in retail outlets, restaurants and office space? Is there an increase in the number of people out along the river or on

More can be found in the upcoming edition of National Park Service publication *Economic Impacts of Protecting Rivers, Trails and Greenway Corridors*. The Fourth Edition (1995) Revised, is available at www.nps.gov/pwro/rtca/econindx.htm.

trails? Has the community with a river redevelopment seen an increase in new residents in that area? Are there community events now being held along the river?



Document Developers' Use of Open Space in Designing and Marketing their Properties

Developers are in business to make money. They pay attention to the trends that attract new buyers and increase the value of their properties. Developments alongside rivers with trails and green corridors are an attractive amenity. Look for advertisements that include beautiful views of a river invoking an attractive lifestyle. Partner with developers that support riverfront redevelopment to promote the concept to the public.

What is your river worth? It can be significant. By following the steps above, researching information and talking to residents, city officials and developers, you will provide relevant information to your community and increase the success of your riverfront redevelopment plans.



- 1 Waterfront Revitalization in Non-Metropolitan Coastal Communities. Washington Sea Grant, 3716 Brooklyn Avenue NE, Box 355060, Seattle, WA 98105-6716
staff.washington.edu/goodrf/astoria_or_sketch.html
- 2 Johnson County Master Plan. 2004. Johnson County MAP 2020. Johnson County, Kansas.
jcpd.com/pages/map2020
- 3 San Antonio Area Tourism Council. www.sanantoniotourism.com/tourism.aspx.
- 4 The Project for Public Spaces has multiple articles on waterfront development at www.pps.org/waterfronts/info/waterfronts_articles.
- 5 Geer, PhD. Donald. *Omaha Recreational Trails: Their Use and Effect on Property Values and Public Safety*. Program in Recreation and Leisure Studies. University of Nebraska, Omaha 2000.

CASE STUDY

The Root River in Racine, Wisconsin:

Planning for Riverfront Revitalization

by Helen Sarakinos
River Alliance of Wisconsin
www.wisconsinrivers.org

It started the way many good things start—with a little serendipity and a little crisis. The serendipity was one of timing: a River Alliance of Wisconsin board member and newly elected State Representative took a long walk along his home river, the Root River in Racine. He saw a city struggling to rebuild itself in the post-industrial age that had an underutilized treasure flowing through the heart of it. The crisis emerged with the public unveiling of a development project at the mouth of the river that would have cut off all public access to the riverfront where it met Lake Michigan. After being approached by local citizens and the City, the developer modified the plan to protect public access to the riverfront (eventually, the development was shelved altogether).

The crisis was averted but interest in the river had been rekindled. While the City adopted several

plans for the management and redevelopment of city areas that touch on portions of the Root River, no comprehensive plan existed that tied together all the separate efforts to rejuvenate and promote the river within the City of Racine. And despite major improvements in the water quality of the river over the last 30 years, many still perceive the Root River as “dirty, industrial and contaminated,” as one resident stated.

Local residents and businesspeople came together in a series of “conversations” to talk about their hopes and visions for the Root River. Eventually, the group evolved into the Root River Council.¹ In partnership with the River Alliance of Wisconsin, the Council identified the need to have a more formalized vision for what riverfront

“Just wait till we show you our river!”

Root River Council member Chuck Snyder



Melissa Warner facilitating a group planning session during a “Root River Conversations” charette.

Photo credit: River Alliance of Wisconsin

redevelopment should look like to avoid having to “react” to proposals that have already been developed and brought before the public.

In 2006, the Root River Council embarked on a public outreach effort to develop recommendations for redevelopment of the Root River waterfront based on four guiding principles:²

- 1) Reorient the city to its river;
- 2) Prompt robust, innovative development and growth with a mix of residential, retail and recreational projects;
- 3) Improve habitat and water quality along the river; and
- 4) Promote the participation of citizens and good public process in decisions affecting redevelopment of the waterfront.

Think urban river plans are only achievable in small cities? Think Again.

The Los Angeles River is one of the most channelized rivers in the country, its cement walls intended to provide the quickest conduit for water to flow through the city into the ocean. River advocates, land owners, state and local officials and the National Parks Service's Rivers, Trails & Conservation Assistance Program succeeded, however, when in the mid 90s, the Los Angeles River Master Plan was developed. The goals of the LA River Master Plan are to:⁶

- Ensure flood control and public safety needs are met.
- Improve the appearance of the river and the pride of local communities in it.
- Promote the river as an economic asset to the surrounding communities.
- Preserve, enhance and restore environmental resources in and along the river.
- Consider stormwater management alternatives.
- Ensure public involvement and coordinate Master Plan development and implementation among jurisdictions.
- Provide a safe environment and a variety of recreational opportunities along the river.
- Ensure safe access to and compatibility between the river and other activity centers.

Los Angeles is making progress. As of February 2007, the Los Angeles River Revitalization Master Plan consisted of 239 projects, including the establishment of parks, open space, pedestrian and bicycle paths, bridges and channel modification projects, and creation of a flood control channel.⁷

The Root River planning process aimed to meaningfully engage residents in a public dialogue about the role of the Root River in a revitalized urban center. The Root River Council worked directly with different stakeholders who have an interest in the river: neighborhood associations and churches, local businesses, developers, recreational, fishing and environmental groups, local schools, Root-Pike Watershed Initiative Network, Downtown Racine Corporation, members of Common Council

whose districts incorporate the Root River and staff from the City Departments of Public Works, Parks, City Development and the Mayor's office.

Both one-on-one interviews and facilitated group meetings were used to receive public input. Interviews were designed to determine how stakeholders perceive and use the river and what they believe is needed to make the river a more central resource for the city. The public visioning

cont. on page 22

Planning for Riverfront Revitalization, cont.

cont. from page 21

process for the Root River Plan was carried out in three public charettes held in the fall of 2007 and facilitated by UW-Milwaukee's Community Design Solutions.³ These working meetings were designed for small group discussions that enabled residents to learn about the current condition of the Root River and share their opinions about its future. Additionally, the Root River Council distributed surveys to Racine area residents. The survey responses and meeting

July 2008 and unanimously adopted in concept by Common Council. The Plan's recommendations included a mix of both policy changes that continue to be developed, as well as a series of items that were immediately "actionable"—from the placement of canoe launches to working with City Parks Administration on placing vegetated buffers along riverfront parks—that groups of citizens could undertake right away.

“Through an established network of community stakeholders and city administration, the planning process successfully developed a clear, concise and community driven plan.”

Bonnie Prochaska, Root River Council Member

discussions shaped the recommendations in the final plan. Melissa Warner, a charrette facilitator and Root River Council Member, was impressed with the level of participation: “People came with interest, imagination and purpose. They contributed ideas on how the riverfront activities would enhance life in Racine, with businesses, residences and entertainment in the urban sector, and recreational amenities and natural enhancements on the upriver sector. The plan that emerged is one that has an exciting and attainable vision for the future.”

City Administration (specifically the Mayor's Office and Departments of City Development, Parks and Public Works) as well as key aldermen and business interests were kept up-to-date on the Root River Council's activities. It was helpful to know that the Mayor and the City Planner saw the value of revitalizing the riverfront; both endorsed and supported the public process.

The final plan, “Back to the Root: An Urban River Revitalization Plan”⁴ was published in

While the vision may take many years to be fully realized, new initiatives have already begun on the Root River. University of Wisconsin-Parkside opened an environmental education and community center that offers recreation and education on the Root River, just west of downtown Racine.⁵ The City completed a comprehensive water quality study of the river in 2007 and, in partnership with the River Alliance of Wisconsin and the business community, is preparing zoning language to formalize and guide development of the river district. But most importantly, residents of Racine are rediscovering their riverfront one boat ride, bike ride and walk at a time, and are beginning to see this namesake river as the source of beauty and inspiration it can be.



¹ www.backtotheroot.org

² This outreach campaign was made possible with funding from the Wisconsin Coastal Management Program, the Racine Community Foundation and the CS Mott Foundation (by way of the River Alliance's participation).

³ www4.uwm.edu/cds

⁴ The final plan and related news articles are available at www.backtotheroot.org.

⁵ www.uwp.edu/departments/community/partnerships/environmentalcentersec.cfm

⁶ ladpw.org/wmd/watershed/LA/larmp_mission.cfm

⁷ www.lariverrmp.org/Media/documents/RiverPlanCNS.doc

Survey the Community

The Root River Council used the following survey to capture information and ideas from the local community.

Root River Community Survey

Thank you for sharing your comments about the Root River!

What are your experiences with the Root River? Please check all that apply:

- | | |
|--|---|
| <input type="checkbox"/> Fishing | <input type="checkbox"/> Walking |
| <input type="checkbox"/> Biking | <input type="checkbox"/> Boating, what type _____
(canoe, kayak, motor boat) |
| <input type="checkbox"/> Bird watching | <input type="checkbox"/> I live nearby the river |
| <input type="checkbox"/> I work nearby the river | <input type="checkbox"/> I own a business near the river |
| <input type="checkbox"/> Other _____ | |

What do you love about the Root River?

What changes would you like to see?

Later this fall we will be holding meetings to discuss the future of the Root River in the downtown and upstream park areas (Island and Colonial, etc.). Would you be interested in attending a meeting to share your concerns and help plan improvements for the Root River?

- ☐ Yes ☐ No

If yes, is a week night or Saturday better? Please check one.

- ☐ Weeknight ☐ Saturday morning ☐ Saturday afternoon

Which location would be most convenient for you to attend the meeting? Please check one.

- | | |
|--|---|
| <input type="checkbox"/> Downtown area | <input type="checkbox"/> West 6th Street area |
| <input type="checkbox"/> Lincoln Park area | <input type="checkbox"/> Location does not matter |

If no, may we ask why not?

- | | |
|--------------------------------------|---|
| <input type="checkbox"/> Too busy | <input type="checkbox"/> Not interested in meetings |
| <input type="checkbox"/> Other _____ | |

Thank you for taking the time to complete this survey! If you would like to be contacted about future Root River meetings please provide us with your contact information.



Friends of the White River has established an interactive, on-water learning experience on an urban segment of the waterway that runs through the state's capital in Indianapolis.

Full day and half day trips utilizing livery-grade rafts allow students, policy makers, potential volunteers for stewardship projects and financial sponsors to paddle through a slow-moving stretch with diverse manmade and natural features. They learn about environmental and economic/historic aspects of the watershed, especially as they relate to its condition within the city.

The current sponsor, United Water, which operates the municipal wastewater treatment plant, has helped develop a unique component of the program that lets urban teens learn about ways they can take part in established improvement and restoration efforts. They are also shown where they can return to responsibly enjoy the river with friends and families. River School, another model program whose partners include city and state agencies, offers a seasonal springboard for integrating education and community service.



Friends of the White River (IN)

www.friendsofwhiteriver.org

www.river-school.org

The Flint River in downtown Flint, Michigan has been channelized, dammed, concreted and forgotten. Recognizing the potential of the river, several Flint business, education, philanthropy and nonprofit institutions started meeting and talking about how the river could serve as a focal point for revitalization of the downtown area. That group formed the Flint River Corridor Alliance, working together to transform the river from a distressed waterway to a natural resource that is an asset to the community.

The Flint River Watershed Coalition, a member of the Alliance, secured funds for a study to help the city re-imagine what the Hamilton Dam could one day look like. In place of a dilapidated, on the verge of failing dam, the city is now considering options that include boat and fish passage, softened concrete banks and access to the river.

Flint River Watershed Coalition (MI)

www.flintriver.org

Flint River Corridor Alliance (MI)

www.frcalliance.org

Since 1999, SOLV's Team Up For Watershed Health Program has been working to revitalize urban watershed sites in the greater Portland, Oregon area. Harnessing volunteer power, SOLV is removing invasive plants and replacing them with native trees and shrubs in riparian/wetland areas to improve water quality, lower stream temperature and create habitat for urban wildlife. SOLV crews and volunteers actively work the site for 3 years, which includes bank reshaping, log/boulder placement, bioengineering, etc., and then maintain and monitor it for another 5 years. In 2008, Team Up For Watershed Health engaged 7,467 volunteers on 64 sites comprising roughly 150 acres. One goal of the Team Up program is to engage community members to expose them to issues confronting watershed health and foster an ethic of stewardship.



Photo credit: Meghan Ballard, SOLV

A volunteer plants trees at Wade Creek at Estacada High School in Estacada, Oregon in November, 2008.

SOLV (OR)

www.solv.org



ookany/Tacony-Frankford (TTF) Watershed Partnership's Model Neighborhood Project is a neighborhood beautification and environmental

education program that centers on stormwater management techniques. In each model neighborhood, TTF meets with local community organizations and collects residents' suggestions for neighborhood improvement. TTF then coordinates this input with Partnership resources and facilitates projects and events that beautify the neighborhood and improve the watershed at the same time. Projects include volunteer clean-up days, neighborhood stormwater management demonstration site tours, rain barrel workshops, volunteer planting events, educational signage, watershed lessons in local schools and the installation of new best management practices such as a campus rain garden, an outdoor classroom and a newly planted riparian buffer. We are focusing our initial efforts in concentrated areas in order to impact watershed health and public awareness in a way that exhibits tangible, positive change that the community can see and feel.

Tookany/Tacony-Frankford Watershed Partnership, Inc. (PA)

www.ttfwatershed.org



Photo credit: Mona Margarita

At a local fair, kids learn about plants' ability to absorb and filter rainwater.



Photo credit: Michael Davis

Children hard at work during the RCS Youth Summit.

BRIGHT IDEA

Create a map of your river, noting access points, portages and resting sites, and provide information on historic, cultural, ecological or scenic points of interest along the way.



he Rivanna Conservation Society (RCS) has a myriad of ways to care for and protect the historic waterway often referred to as "Mr. Jefferson's River"

(Monticello is located on the banks of the Rivanna River). Because erosion and sedimentation are among the Rivanna's primary pollution sources, RCS has a robust buffer planting program, a community wide chemical water quality monitoring program (biological monitoring is done by RCS partner StreamWatch), a bus and public buildings poster project (the result of winning the Charlottesville Design Center's Design Marathon), a Rivanna River Sojourn and a comprehensive program of river trips. RCS also hosts an annual Rivanna River Clean up from the headwaters to the confluence with the James River and facilitates mini clean ups throughout the year. RCS took the lead in the breaching of the Woolen Mills Dam in Charlottesville and has petitioned the State Legislature to designate the Rivanna as a Scenic River.

Rivanna Conservation Society (VA)

www.rivannariver.org



e have partnered with trail and wetland groups on improving the Wabash River.

Principally working through our nonprofit organization, Banks of the Wabash, we are spreading "DeTrash the Wabash" litter clean-ups along the cities of the corridor. Utilizing the volunteer strengths of the local group, we promote pairing conservation trails and riparian corridors throughout the floodplain. Oftentimes, a river park or trailhead can be developed as a local focus, meeting, interpretive/educational source and/or access point. Trail money is often found from hospital boards (promoting fitness), and preservation funds may arise from contacts cultivated among art lovers with a river-centric art show or painting day.

Wabash River Heritage Corridor Commission (IN)

www.in.gov/wrhcc

www.banksofthewabash.org

VOICES FROM THE FIELD

The Lower Passaic River in northern New Jersey is a severely contaminated urban river that has been neglected for over 50 years. Progress on restoring the river by removing the toxic sediment has been moving at a snail's pace. Fortunately, there is now enough research available to choose a plan to deal with the contaminated sediment and restore the river.



Researchers taking core samples of contaminated river sediment near Newark, N.J.

Pressure from the towns and cities surrounding the Lower Passaic River is critical in order to continue pushing the cleanup project along. The Passaic River Coalition is creating a set of publications to convey the urgency that "Now is the time to clean the Passaic River." The project is funded by an EPA Technical Assistance Grant and outlines actions needed to clean the river. This spring and summer, the Passaic River Coalition plans to give presentations about the Lower Passaic River in order to raise local support by helping communities understand the benefits of a clean river.

Passaic River Coalition (NJ)
www.passaicriver.org

BRIGHT IDEA

Add "green bulkheads" to armored shoreline walls in order to provide habitat and a food source to larval fish and other wildlife. One innovative option now being considered for the Cuyahoga River is the Cuyahoga Habitat Underwater Basket, constructed from recycled, molded rubber that hold plants and hang by chains at various heights.
www.cuyahogariverrap.org/GREENBULKHEAD.html



For over the past three years, Friends of Alum Creek and Tributaries (FACT), has endeavored to remove two lowhead dams from the Alum Creek River between Wolfe Park-Academy Park and Nelson Park in Columbus, Ohio. The Ohio EPA conducted studies in 1996 and 2000 and found that areas of Alum Creek did not meet water quality specifications. One reason for the poor water quality was because the water current slowed down behind the dams and organic material in the water settled to the river bottom and decayed, resulting in sharp reductions in dissolved oxygen. Improving water quality was the primary reason for the removal of the lowhead dams, but their elimination also addressed safety hazards and increased accessibility for recreational pursuits (e.g., canoeing).

While the physical extraction of both lowhead dams actually took less than one month, the preparations spanned four years. The process started in 2005 with receipt of an EPA 319 Nonpoint Source Implementation grant. With guidance from FACT's contracted environmental consulting engineering firm Burgess & Niple, Inc., biological, streambed physical structure and property boundary surveys were completed, the US Army Corps of Engineers Nationwide permit was received, and the conceptual and final technical design plans were ultimately approved. The Wolfe-Academy Park lowhead dam was first notched on October 6, 2008 and soon after, on November 11th, Nelson Park lowhead dam was breached and fully removed.

Friends of Alum Creek (OH)
www.friendsofalumcreek.org/sitev2/lowheaddamremoval.html



ver the past five years, a team of Earth Force students from Jr. PLEWA, the Pennsylvania Lake Erie Watershed Association, have been working together to make the City of Erie more sustainable. The students have tackled the large amount of cigarette butts littering the city's streets and tainting the shores of Lake Erie, and have designed and implemented a rain garden at City Hall which serves as a demonstration project for individuals and businesses who are looking for soft development techniques for stormwater management.

Their latest project, "Bottled Up—you have your own company in your faucet" challenges people to just say no to bottled water and use tap water instead. They educate the Erie community and others via press conferences, newspapers and at the Erie Arts Festival, Celebrate Erie, and other community events. These students serve as role models to their peers by showing how commitment to environmental citizenship can help make a difference.

Lake Erie-Allegheny Earth Force (PA)
www.earthforce.org



Earth Force and Jr. PLEWA members showcase a sign describing the rain garden near City Hall.

Photo credit: Lake Erie-Allegheny Earth Force



This trash fish was made out of waste found in the river running through Gwynns Falls Park in Baltimore, MD.

Photo Credit: Cindy Sims Parr

BRIGHT IDEA



Create trash art from your river clean-up booty. Not only is it fun for volunteers, it will remind viewers of the importance of waste reduction, recycling and proper disposal.



he Feather River Coordinated Resource Management Group has worked on Wolf Creek in Greenville, CA in a series of phases since 1989. A really good critique of the inset channel stabilization techniques we've tried there can be found on our website in a publication called *Evaluation of Geomorphic Restoration Techniques Applied to Fluvial Systems*.

Feather River Coordinated Resource Management Group (CA)
www.feather-river-crm.org



or years, the Sun River Watershed Group (SRWG) worked on water quality issues that were not in the city limits of Great Falls, but had an affect on the community's water system. A few years ago, the city manager approached the SRWG stating the city would contribute resources to clean up the river bed and banks if the SRWG would lead the charge. After a few meetings with all potential partners, a plan of attack was established, funds were raised and permits were acquired to remove trash and old cars from the lower Sun River near Great Falls. The result to date has been amazing, with 405 cars removed and over 40,000 pounds of trash including tires, car parts and hot water heaters removed from approximately five miles of the lower Sun River.



Hauling away debris pulled from the Sun River.

Photo credit: Sun River Watershed Group

Sun River Watershed Group (MT)
nris.state.mt.us/wis/sunriver

VOICES FROM THE FIELD

CASE STUDY

The Bronx River Alliance:

Educating the Stewards of Tomorrow

by Damian Griffin
Bronx River Alliance
www.bronxriver.org

I get the green ones!” It is 10:30 am on a cool October morning and six 9th grade students from Banana Kelly High School in the south Bronx are arguing over which waders to wear as their classmates finish their journal entries. Plastic bottles, thermometers and view scopes in hand, the students waded out into the Bronx River to begin collecting water samples. Before 11:30, the class will have tested at least three replicates, written down the pH, dissolved oxygen, and five other parameters that they test for on a weekly basis, thus fulfilling a part of the requirements that make up a major part of their 9th grade combined science and math class. Their teachers will also ensure that the data is provided to the Bronx River Alliance as a part of the Bronx River Stewards Water Quality Monitoring Program.¹ This program gives local residents, educators and their

students, job training program participants and other organizations a chance to participate in real world science that may have an impact on their community while providing valuable data on the health of the river.

One of the little-known marvels of the New York City landscape, the 23-mile Bronx River winds down through southern Westchester and the Bronx to define a peaceful corridor of green for fishing, strolling, biking, boating and nature study amid the noise and bustle of urban life.

Since its inception in 2004, the Stewards Program has trained and provided equipment for over 50 people per year to be river stewards who commit to weekly water quality monitoring at a site along the eight miles of Bronx River that flows through the Bronx. The main goal of the program is to



The Bronx River Alliance is a nonprofit organization that partners with the New York City Department of Parks & Recreation to work towards the rehabilitation of the Bronx River and its environs, coordinate the development of the Bronx River Greenway, and act as a support and partner for over 100 other community based organizations that share common goals for improving the river. Born from the early efforts of groups including the Bronx River Restoration Project, today the Alliance has nine full time crew members who work on river projects daily, from clearing river blockages to removing invasive plants and planting native species.



Yen Le conducts fish monitoring in the Soundview Lagoons restoration area.

collect baseline data on water quality and identify any issues, but organizing an attentive and dedicated group of people who feel real ownership of the river is just as important. Trainings for prospective and existing stewards are offered in partnership with Global Learning and Observations to Benefit the Environment

(GLOBE), a school-based science and education program. While the protocols (pH, dissolved oxygen, turbidity, temperature, nitrates and salinity) are covered, a good deal of time is spent on the scientific method and the overall context of their work in the rehabilitation of the river. Since then, some 90% of all illegal spill and dumping reports that have been filed in relation to the Bronx River have been filed by Bronx River Stewards. These “eyes on the river” have had an effect on behaviors as well as on the river. While illegal dumping still occurs occasionally, it is no longer taken for granted.

Sharing Data, Prompting Action

Inclusion in the GLOBE program has many advantages for a monitoring program. The protocols are well laid out on the website which includes videos and other learning

tools which may serve as support for stewards beyond the trainings, and the data uploading capability eliminates the need for maintaining one’s own database. GLOBE offers a public website that provides access to collected data to an audience well beyond those involved in each program. Analysis can be done in-house, but other interested parties can view and analyze the data as well. The fact that the GLOBE program also has protocols in disciplines other than hydrology opens up the opportunity for many other monitoring and study projects, should a participating group be interested in further investigation.

Education

The Stewards Program is not a stand-alone program that exists only to collect data from the river. Rather, it is part of an education program that seeks to encourage and support educators to use the Bronx River as a classroom. Many of the stewards are teachers who are looking for ways to include real world science into their classroom studies, and the Alliance Education Program works to provide incentives and support for teachers of any subject, including math, art and language arts, to get students out to the river. For example, at this time there is a combined anthropology/film class from a nearby college making a series of films about human interaction with the river, a professor guiding senior projects to measure the quantity of fecal coliforms during different weather events as a part of our pilot bacteria monitoring program, and a group of architecture and design undergrads working with high school students to create artistic representations of the different areas where the river flows. This connection with teachers means that the number of “eyes on the river” grows each year.

Educating the Stewards of Tomorrow, cont.

cont. from page 29

Improving Access

One of the expressed goals of our organization is to improve access to the river itself. Our experience has been that direct contact with the river ignites the feeling of ownership and stewardship, and coupling that contact with a unique experience in our urban environment makes that fire burn its brightest. The Alliance advocates for small non-motorized craft put-ins in all parks that border the river, as well as offering canoe trips to local school groups and running a public canoeing program on many Saturdays in the summer months. Last year, the biggest ever event, saw 1500 participants paddle some part of the Bronx River, many having their first ever canoe experience. Paddlers ranged from a fourth grade class from the Riverdale section of the Bronx, to a Lehman College Recreation Program, to three generations of Bronx residents that have spent their lives in sight of the Bronx River but never dreamed that they would paddle its waters together.

There is plenty to be said about the different aspects of the Stewards Program and what makes it function, but the following are a few basic ideas that can guide others on how to get a similar program started:

- **Protocols:** Choose protocols that focus on your goals, are accessible to a variety of participants and can be used as teaching tools.
- **Partners:** Look into schools, afterschool programs, neighborhood associations and community-based organizations for volunteers interested in monitoring. Everyone benefits from engaging in the scientific process.
- **Resources:** Use of free training materials and an existing database provides more access for less initial start up. The GLOBE representatives are also an incredible resource.



Photo credit: Damian Griffin, Bronx River Alliance

Carlos Duran finds an unexpected guest during the portage around the Snuff Mill Dam on a Bronx River canoe trip.

- **Access and Recreation:** Look for ways to make direct contact with the water. While some areas are limited to only allowing a bucket throw for water, when possible, wading in and on-water recreation have a profound effect.

There are some truly amazing groups running monitoring programs throughout the country. A good way to find out how their programs operate and to get answers to questions as diverse as “What is the best bacteria protocol” and “How do I prove all of this matters?” is to sign on to the EPA Volunteer Monitoring message board.² And feel free to visit our site, www.bronxriver.org, or contact us. As we learn more every day, we are also willing to share all that we have learned.



¹ This program follows in the footsteps of earlier efforts put forth by Bronx River Restoration, Teresa Crimmins, Anne-Marie Runfola and others.

² Found at lists.epa.gov/read/all_forums/subscribe?name=volmonitor.

Daylighting:

Why We Need to Take Our Creeks Out of Pipes

When the citizens of Berkeley so generously passed a small¹ bond measure in the late 1970s to put parks in neighborhoods in which there were none, they created an opportunity to daylight a portion of a creek for the first time in California—and possibly—the nation.

“Daylighting” means digging down to where the pipe is and removing it so that the water is able to run freely in its channel, open to the daylight.

A new park was designed and built by the city on an old railroad right-of-way, and changed the area from a desolate dumping ground to one of the most heavily used parks in Berkeley. Strawberry Creek, in a 350 foot cement culvert, bisected the area, and city engineers were opposed to the Parks and Recreation Commission’s proposal to open it. As chair of the Commission, I set a public hearing so that the community could see what was being planned and comment on it. When the City finally did agree to daylight Strawberry Creek and the culvert was removed, the children of this rather poor neighborhood sat on the banks, on the broken concrete and silently watched in awe at their first sight of the creek water flowing.

Aside from providing a creek for those kids to enjoy, another outcome was the formation of the Urban Creeks Council in 1982, which has since opened five more creeks and restored a number of already open, but trashed creeks in the East Bay. Opening culverted creeks, while often the most difficult and most complicated to achieve, is also the most rewarding and thrilling work we do. The hurdles that have to be dealt with are many and somewhat different each time. First is getting the proposal accepted by the community and the local government. One must begin by allowing all objections to be heard and responded to. It takes time but must be done so that when the project goes out for funding these issues have been addressed. Then the planning process needs to be open to the community in order to get their input. There will always be naysayers, but if most people are positive, it can happen.

In order to combat knee-jerk reactions against daylighting streams, a concerted process of educating governmental officials and the public about how a daylighting project will benefit their community (and make them look good).

by Carole Schemmerling
Urban Creeks Council
www.urbancreeks.org

Arguments against daylighting streams that must be overcome:

- It will attract the homeless
- It will attract rodents
- The creek will become a dump or a sewer
- Daylighting the creek will cause flooding
- Children will drown in the opened creek
- There will be large maintenance costs
- Criminals will use the creeks.



cont. on page 32

Why We Need to Take Our Creeks Out of Pipes, cont.

cont. from page 31

Here are some of the most important benefits of daylighting streams:

- **Water quality:** when the stream is in culverts, it is hard to determine what is in the water. Since a lot of culverts drain the streets and other impervious surfaces, all organic and inorganic pollutants are carried to the receiving body of water. Once a stream has reached a large river, bay or ocean, it is no longer possible to capture the pollutants. Open streams with lots of riparian vegetation take up more pollutants than any treatment facility can. Vegetated small streams are terrific water purifiers.
- **Flood control:** streams in culverts are like bullets in guns. Water “shoots” out at top speed and often creates damage and flooding. Most culverts, being manmade, are ageing and deteriorating. They leak and break, and branches and debris become jammed in the pipe. Then the water backs up and can flood upstream, or as it happened in Berkeley, one very wet winter, the jammed culvert exploded up through the floor of a drugstore above in a huge geyser! Flood control is best achieved with open, vegetated streams that slow velocity of the current and allow the water to soak into the soil on the banks of the river.
- **Habitat:** when a 200 feet portion of a creek was daylighted and vegetated with lots of willows it very quickly became a residence for black phoebes where no one had seen them before. The great losses of riparian plants everywhere, not only in the cities, have had very negative effect on the bird population. In local creeks that we have opened, we are seeing steelhead coming upstream and spawning. All of the biota and shade that abound in opened and restored streams make for the viability of birds and fish, who then become our “canaries in the coal mine;” their presence tells us about water and air quality.

A SAMPLING OF CREEKS THAT HAVE BEEN DAYLIGHTED:

Embarass Creek, Urbana, IL, early 1970s

Phalen Creek, St. Paul, MN, 1987

Codornices Creek, Berkeley, CA, 1993

Shoal Creek Tributary, DeKalb County, GA, 1994

Blackberry Creek, Berkeley, CA, 1995

Arcadia Creek, Kalamazoo, MI, 1995

Pimmit Run Tributary, McLean, VA, mid 1990s

Darbee Brook, Roscoe, NY, 1996

Cow Creek, Hutchinson, KS, 1997

Pointsett Creek, El Cerrito, CA, 1997

Valley Creek, Port Angeles, WA, 1997

Village Creek, Albany, CA, 1998

West Ox Pasture Brook, Rowley, MA, 1999

- **Education:** in many places in California, schools have been built on or very near creeks. We preach the value of these resources as educational tools. In one school where we opened the creek, not only was it the children's favorite place to learn about nature, it provided a powerful lesson in civics and the power of communities working together. The opened stream was plagued with sewage spills, so that the children were not allowed to go there. They learned about how folks used to put towns together in the old days...running sewer lines next to or in the creek, never considering what would happen when they broke or fell apart. Finally the kids at the school took action. They asked their teacher to take them to a City Council meeting to ask the Mayor and the councilors to stop the polluting. Within a relatively short time, an old, unknown sewer line was discovered and removed. One of the third graders who helped lobby for a cleaner creek remarked how happy he was that the creek was clean and that he could play in it, but that he had loved the creek even when it was polluted.
- **The public trust:** the Public Trust Doctrine was once a concept and policy that was part of the social fabric of sharing resources for the common good. It has fallen into disuse in the last few decades because of intense lobbying for and defense of property rights over all other rights. In Montana, downstream neighbors on a large creek have no water and no rights to the water because the upstream ranchers have used an old statute that allows them to keep all the water. Idaho has recently refused to allow the Public



Photo credit: Urban Creeks Council

The opening of Blackberry Creek.

Trust any standing in court. They have done away with the Doctrine entirely. On the other hand, California refers to the "waters of the state" in its policies and enforcement code. And there is more of a sense that the Public Trust Doctrine is a useful and necessary tool in protecting and enhancing our very valuable resources. In addition, the Clean Water and Clean Air Acts have to be strenuously enforced and strengthened, in order to stop and reverse the damage that has and is being done.

Daylighting streams is one of the most immediately rewarding ways to make positive changes in the urban environment. By following the lead of others who have daylighted streams in California and in other urban areas, we can work towards dramatically improving our cities' habitat and increasing the health and vitality of our waterways.



CASE STUDY

Upper Chattahoochee Riverkeeper & Metro Atlanta: It Takes a City

by Mary Olivia Harrison
Upper Chattahoochee
Riverkeeper
www.ucriverkeeper.org

Driving in Atlanta, surrounded by towering buildings and a dense sea of concrete, it would be easy to miss the ribbon of water that winds its way through the fastest growing city in the nation. But if it wasn't for the Chattahoochee River and the reservoir created on its main stem north of Atlanta in the 1950s, Lake Sidney Lanier, Atlanta could never have become the thriving metropolis it is today.

The river is now strained to the breaking point after years of drought, decades of unchecked development and a lack of systemic water efficiency programs in the metro region. State leaders have engaged in a water war with Alabama and Florida to keep more of the Chattahoochee's water in Lake Lanier, without much regard to the communities and wildlife downstream that depend upon it. They have proposed taking water from the Tennessee River (which doesn't actually belong to us) and building expensive reservoirs in the headwaters of our basin.

None of these "solutions" will ultimately solve the problem, nor do they make the

Chattahoochee a cleaner, more abundant waterway or teach those who depend upon it to be better stewards of the river.

Over the years, Upper Chattahoochee Riverkeeper (UCR) has developed a number of approaches to revitalizing our urban river by reaching out to diverse audiences, including civic groups, developers and paddlers. We have found that we must convey a sense of urgency about the threats our river faces while balancing the "doom and gloom" with opportunities to celebrate the Chattahoochee as an irreplaceable resource. Some of the strategies we have used are described below.

Tackling Stormwater Runoff

When UCR was founded in 1994, its first order of business was to try to stop the billions of gallons of untreated sewage and polluted stormwater that flowed into the river and its tributaries from combined sewer overflows whenever it rained.

Now UCR is waging a war with more ambiguous enemies of a healthy river. It's easy to understand that bacteria in the untreated sewage flowing into neighborhood streams and the river constitutes a public health threat and must be stopped. It can be more difficult, however, to convince elected officials and decisionmakers that unplanned growth and development can harm the waterway that is the region's lifeblood.

In 2005, UCR began a program called "Get the Dirt Out" to tackle the problem of stormwater runoff flowing from construction sites into our river system. Thanks to an EPA grant, we studied the effectiveness of Georgia's erosion control program—the centerpiece of which is a set of regulations called the General Stormwater Permit for Construction Activity (General Permit) that implements



Photo credit: Tom Wilson

Low water level in Lake Lanier.

federal and state stormwater control requirements. From 2005-2006, UCR worked with other watershed protection and riverkeeper groups around the state to investigate Georgia's implementation of its General Permit program. With a focus on improving water quality, we developed educational materials and tools to document problems and evaluate the effectiveness of best management practices (BMPs) intended to prevent the flow of muddy water from construction sites into our waterways. We identified sites for investigation through file analysis, observation and citizen complaints, deliberately focusing on sites with suspected stormwater problems. Some of our recommendations have been incorporated into local and state regulatory programs, including the renewal of the 2008 General Permit.

UCR has trained hundreds of citizens, local officials, developers and engineers through our two-hour "Get The Dirt Out" workshops (www.getthedirtout.org) to identify sediment control violations and how to report them. We're proud that this program concept has been embraced by other watershed and Riverkeeper groups in Georgia and the Southeast.

Making an Argument

With the ongoing water crisis in north Georgia as a catalyst, UCR decided to create a new public education program to address water supply problems. In 2008, we created a PowerPoint presentation entitled *Tapped Out: The Drying Up of Atlanta* to educate citizens, business leaders and policymakers about why we are in the crisis we are in and what we can do about it in our homes and businesses.

First we define the problem—a finite water supply in a small watershed, hydrological changes due to impervious surfaces and an ever growing water demand. The

Chattahoochee provides drinking water for about 3.5 million people in metro Atlanta, or 73% of the population, a number that is expected to double by 2050.

In *Tapped Out*, we explain what a watershed is, reveal the small size of the upper Chattahoochee drainage, and then demonstrate what happens when we harden the surface of our watershed with roads, rooftops and parking lots. Once people understand how these land use changes affect our water supply, they are amazed to learn that every day in metro Atlanta 55 acres of land are converted to hard surfaces.

We also explain how we are wasting water through the inefficient use of water and energy in metro Atlanta. Most people do not realize that it takes water to produce energy. As one example, if every household in Georgia replaced just one incandescent light bulb with a compact fluorescent light bulb, each year the state would save more than 4 billion gallons of water.

cont. on page 36

BRIGHT IDEA

Hold a festival on the river that includes any combination of educational activities, games, competitive events, food, music—the sky's the limit! The City of Portland attracted over 4,000 attendees for its first annual River Fest!, aimed at encouraging people to become better acquainted with the Willamette River and more committed to protecting it.



It Takes a City, cont.

cont. from page 35

Finally, we offer solutions that individuals, businesses and communities can embrace because they enhance quality of life and are good for business—water efficiency, energy efficiency and sustainable growth. We have presented *Tapped Out* to more than 2500 people to date, including local rotary groups, garden clubs, companies and utilities.



Photo credit: Upper Chattahoochee Riverkeeper

Two corporate cleanup volunteers look for trash to be used in the art auction.

Making It Personal

As much as our logic, research and information serve us, the best advocate for the Chattahoochee River is the river itself. Nothing makes someone love a river and fight for her as much as experiencing it firsthand, so UCR created a River Discovery Series of paddle trips to generate greater involvement and awareness of our river's needs.

Hosted by UCR in partnership with the National Park Service, the paddle series covers 37 miles of the Chattahoochee River National Recreation Area on five different trips. During each segment, a National Park Service Ranger educates participants about

wildlife, history, and the impacts the city's growth has had on the river. Even in our urban landscape, we can observe Great Blue Herons and Red Tailed Hawks, and navigate prime trout waters. We identify Native American sites and float past oak hickory forests.

Our participants have shown their growing passion for the river with their continued involvement in UCR, and we are offering the series again in 2009.

UCR also offers corporate partnerships for businesses that want to take their employees on river cleanups to build camaraderie, a sense of accomplishment, and engage the company in a deeper, more personal investment. One of our corporate partners, a local broadcast studio called Riot Atlanta, even used the trash from a river cleanup to create an art mosaic that was auctioned off through eBay in March to benefit UCR.

BRIGHT IDEA

Rain barrels are for cities, too! Engage neighbors in workshops on making and installing rain barrels. Every drop of rain water that is saved and reused is a drop of stormwater that won't wash into streams and a drop of water that doesn't have to be withdrawn from local water sources.



Putting it all Together

Building partnerships, informing the public and bringing people out on the river are all vital to our work to save the Chattahoochee River, one of the most endangered waterways in the country. After decades of unchecked and unsustainable growth, it will take the concerted effort of metro Atlanta's citizens, leaders, and businesses to protect and preserve the river that sustains us. It's going to take a city.



GETTING IN STEP: A GUIDE FOR CONDUCTING WATERSHED OUTREACH CAMPAIGNS

Would your group like to create an outreach campaign similar to Upper Chattahoochee Riverkeeper's *Tapped Out: the Drying Up of Atlanta*? EPA has outlined the following steps for creating a successful watershed campaign:

Step 1: DEFINE YOUR DRIVING FORCES, GOALS, AND OBJECTIVES

- ☐ Are the objectives specific, with time limits and measurable components?
- ☐ Will the objectives be accepted and understood by the people that will be affected by them?
- ☐ Will I be able to evaluate whether the objectives were accomplished?
- ☐ Do I have the resources to accomplish the identified objectives?

Step 2: IDENTIFY AND ANALYZE THE TARGET AUDIENCE

- ☐ Have I defined the audience in a way that separates it from the general public?
- ☐ Have I identified the opinion leaders, information disseminators and gatekeepers?
- ☐ Have I segmented the target audience so that I can develop messages for each subgroup?
- ☐ Have I identified the communication channels used by the target audience?
- ☐ Do I understand and know what is important to the target audience?
- ☐ Do I know what barriers prevent the target audience from changing its behavior?

Step 3: CREATE THE MESSAGE

- ☐ Is the message relevant and accessible to the target audience?
- ☐ Is the message vivid and memorable?
- ☐ Have I included personal goals in the message?
- ☐ Have I road-tested the message with members of the target audience?
- ☐ Can the target audience respond to the message in an easy, convenient way?
- ☐ Have I successfully identified which behaviors to ask the target audience to change?

Step 4: PACKAGE YOUR MESSAGE

- ☐ Is the format appropriate for the message and for the target audience?
- ☐ Does the format favor or exclude any members of the target audience?
- ☐ Does the format grab the attention of the target audience?
- ☐ Do I have the resources necessary to prepare and use the selected format?
- ☐ Will I have enough time to produce and distribute this format?

Step 5: DISTRIBUTE THE MESSAGE

- ☐ Do I have the resources necessary to distribute the message?
- ☐ Will I have enough time to distribute the message?
- ☐ Will I be able to distribute messages in this format effectively?
- ☐ Have I chosen the appropriate marketing method for my message?
- ☐ Am I distributing my outreach materials effectively?

Step 6: EVALUATE THE OUTREACH CAMPAIGN

- ☐ Do I have a baseline on the target audience's behaviors, beliefs, and attitudes?
- ☐ How will I know whether the target audience has received the message?
- ☐ What tools will be used to assess the impact of the outreach campaign?
- ☐ What will be done with the results of the evaluation?

Getting In Step: A Guide for Conducting Watershed Outreach Campaigns was prepared by Tetra Tech, Inc., under a contract with the U.S. Environmental Protection Agency (EPA). This guide offers advice on how watershed groups, local governments, and others can maximize the effectiveness of public outreach campaigns to reduce nonpoint source pollution and protect the lakes, rivers, streams, and coasts that we treasure.

www.epa.gov/owow/nps/toolbox/print/getnstepguide.pdf

Resources & References

Daylighting: New Life for Buried Streams. Richard Pinkham, Rocky Mountain Institute (2000). This publication discusses the history of and rationale for daylighting streams, with in-depth case studies of daylighted streams across the country.

www.rmi.org/images/PDFs/Water/W00-32_Daylighting.pdf

Ecological Riverfront Design: Restoring Rivers, Connecting Communities. American Planning Association and American Rivers (2004). Betsy Otto, Kathleen McCormick, and Michael Leccese. This report provides a set of planning and design principles that will allow communities to reclaim urban river edges in the most ecologically sound and economically viable manner possible.

www.americanrivers.org/library/reports-publications/ecological-riverfront-design.html

Economic Impacts of Protecting Rivers, Trails and Greenway Corridors. By the National Park Service Rivers, Trails & Conservation Assistance Program (1995, Revised), this publication provides examples of how greenways and parks have benefited local and regional economies and demonstrates how to determine potential economic impacts of river, trail and greenway projects.

www.nps.gov/pwro/rtca/econindx.htm

Getting in Step: A Guide for Conducting Watershed Outreach Campaigns. An EPA publication, this guide includes tips and tools for creating awareness, educating specific audiences and motivating positive behavior change to improve water quality.

www.epa.gov/owow/nps/toolbox/print/getnstepguide.pdf

National Menu of Stormwater Best Management Practices. Compiled by EPA's NPDES program, the Menu provides information on stormwater management related to public education, public involvement, illicit discharge detection and elimination, construction, post-construction and pollution prevention/good housekeeping.

www.epa.gov/npdes/stormwater/menuofbmps

Reducing the Impacts of Construction Site Activities in Your Watershed. By the River Alliance of Wisconsin, this tool highlights actions local groups and citizens can take to help prevent the impacts of construction activities on water resources.

www.wisconsinrivers.org/documents/localgroups/construction.pdf

Rivertown: Rethinking Urban Rivers. Editor Paul Stanton Kibel (MIT Press, 2007). *Rivertown* examines urban river restoration efforts across the United States. It also analyzes the roles of the federal government (in particular, the U.S. Army Corps of Engineers) and citizen activism in urban river politics.

Stream Restoration Design Handbook. By the United States Department of Agriculture Natural Resources Conservation Service, this handbook presents a variety of engineering and ecological assessment and design tools for stream restoration.

directives.sc.egov.usda.gov/viewerFS.aspx?id=3491

Urban Subwatershed Restoration Manuals. Written by the Center for Watershed Protection, this series of 11 manuals provides detailed and accessible guidance on how to repair urban watersheds.

www.cwp.org/Store/usrm.htm

ORGANIZATIONS & AGENCIES

National Park Service's Rivers, Trails & Conservation Assistance Program provides technical assistance to locally-led natural resource conservation and outdoor recreation projects.

www.nps.gov/nrcr/programs/rtca/contactus/cu_apply.html

The **Urban Creeks Council**, based in Berkeley, California, preserves, protects, and restores urban streams and their riparian habitats.

www.urbancreeks.org

The **Waterfront Center** assists communities in making the wisest and best long-term uses of waterfront resources for maximum public benefit, and organizes an annual international conference on waterfront planning, development and culture.

www.waterfrontcenter.org

Earth Force's Global Rivers Environmental Education Network (GREEN) provides middle and high school students with opportunities to acquire essential academic skills while actively engaging in their communities around water quality issues. GREEN also works to connect educators to outstanding local partners.

www.earthforce.org/section/programs/green



Let River Network Help You Keep Your Head Above Water!

Join the River Network Partnership and connect to the information and resources you need to stay afloat!

Access our River Source Information Center with the 1-800 hotline:

Let us help you research a particular issue and put you in touch with the necessary contact and resources through one-on-one consultations.

Log onto our Partner-only website: Browse updated postings of funding sources, upcoming events and trainings, and templates and river clipart.

Receive numerous other Partner benefits: Benefits include subscriptions to *River Voices* and the *River Fundraising Alert*, access to the online *Directory of Funding Sources for River and Watershed Conservation Groups*, one free publication, discounts on all other River Network publications, and much more!

☐ New Partner

☐ Partner Renewal

Sign Me Up!
www.rivernetwork.org



Annual Partner Dues
are only \$100.

☐ Organizational Partner

☐ Agency/Tribal Partner

☐ Individual Partner

Name _____ Phone (____) _____

Org/Agency _____

Address _____

City _____ State _____ Zip _____

Email _____ Website _____

☐ My check is enclosed

Please charge my credit card: ☐ Visa

☐ MasterCard

☐ American Express

Card # _____ Exp. Date _____

Signature/Name on Card _____

First time Partners will receive an initial set of Partner materials, including your choice of (check one):

☐ How to Save a River ☐ Starting Up: A Handbook for New River and Watershed Organizations

☐ River Talk! Communicating a Watershed Message ☐ Listening to Watersheds - A Community-Based Approach to Watershed Protection ☐ Testing the Waters - Chemical & Physical Vital Signs of a River

Please make your check out to River Network and return this form to:
River Network, 520 SW 6th Avenue, Suite 1130, Portland, OR 97204.

River Network works to support you and your needs. We provide training and technical assistance to our Partner groups. River Network does not promote legislation or represent your organization in legal matters.



River Network

Connecting People, Saving Rivers

520 SW Sixth Avenue, Suite 1130
Portland, Oregon 97204-1511

ADDRESS SERVICE REQUESTED

NON PROFIT
U.S. POSTAGE
PAID
PORTLAND, OR
PERMIT NO. 3470

Register for River Rally Today!



River Network's

10th National River Rally is just around the corner!

May 29 - June 1, 2009 at the Hyatt Regency Baltimore

REGISTER TODAY at www.rivernetwork.org/rally

Join us for over 80 workshops, including tracks of workshops devoted specifically to urban and stormwater issues.

A sampling of workshops include:

- Urban River Restoration/Revitalization
- Urban Diversity & Environmental Restoration
- Urban Forestry
- Retrofitting in Pavement Paradise
- Citizen Monitoring of Construction Stormwater Runoff
- Urban Fish Habitat Replacement

*Together, we will
celebrate rivers, teach and
learn from each other
and explore the power of
citizen action.*